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AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all prior listings and versions:

1. (original): An isolated, non-canonical zinc finger binding protein comprising one or more non-canonical zinc finger components that bind to a target sequence.
2. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 1 30, wherein the target sequence is a nucleic acid sequence.
3. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 1 30, wherein the target sequence is an amino acid sequence.
4. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 2, wherein the target sequence is DNA.
5. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 2, wherein the target sequence is RNA.
6. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 1 30, wherein the amino acid sequence of one or more of the zinc finger components is selected from the group consisting of: X₃-B-X₂₋₄-Cys-X₁₂-His-X₁₋₇-His-X₄; X₃-Cys-X₂₋₄-B-X₁₂-His-X₁₋₇-His-X₄; X₃-Cys-X₂₋₄-Cys-X₁₂-Z-X₁₋₇-His-X₄; X₃-Cys-X₂₋₄-Cys-X₁₂-His-X₁₋₇-Z-X₄; X₃-B-X₂₋₄-B-X₁₂-His-X₁₋₇-His-X₄; X₃-B-X₂₋₄-Cys-X₁₂-Z-X₁₋₇-His-X₄; X₃-B-X₂₋₄-Cys-X₁₂-His-X₁₋₇-Z-X₄; X₃-Cys-X₂₋₄-B-X₁₂-Z-X₁₋₇-His-X₄; X₃-Cys-X₂₋₄-B-X₁₂-Z-X₁₋₇-Z-X₄; X₃-Cys-X₂₋₄-Cys-X₁₂-Z-X₁₋₇-Z-X₄; X₃-Cys-X₂₋₄-B-X₁₂-Z-X₁₋₇-Z-X₄; X₃-B-X₂₋₄-Cys-X₁₂-Z-X₁₋₇-Z-X₄; X₃-B-X₂₋₄-B-X₁₂-His-X₁₋₇-Z-X₄; X₃-B-X₂₋₄-B-X₁₂-Z-X₁₋₇-His-X₄; and X₃-B-X₂₋₄-B-X₁₂-Z-X₁₋₇-Z-X₄, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.
7. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence X₃-B-X₂₋₄-Cys-X₁₂-His-X₁₋₇-His-X₄, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

8. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence X₃-Cys-X₂₋₄-B-X₁₂-His-X₁₋₇-His-X₄, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

9. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence X₃-Cys-X₂₋₄-Cys-X₁₂-Z-X₁₋₇-His-X₄, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

10. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence X₃-Cys-X₂₋₄-Cys-X₁₂-His-X₁₋₇-Z-X₄, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

11. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence X₃-B-X₂₋₄-B-X₁₂-His-X₁₋₇-His-X₄, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

12. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence X₃-B-X₂₋₄-Cys-X₁₂-Z-X₁₋₇-His-X₄, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

13. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence X₃-B-X₂₋₄-Cys-X₁₂-His-X₁₋₇-Z-X₄, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

14. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence X₃-Cys-X₂₋₄-B-X₁₂-Z-X₁₋₇-His-X₄, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

15. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence $X_3\text{-Cys-}X_{2.4}\text{-B-}X_{12}\text{-His-}X_{1.7}\text{-Z-}X_4$, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

16. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence $X_3\text{-Cys-}X_{2.4}\text{-Cys-}X_{12}\text{-Z-}X_{1.7}\text{-Z-}X_4$, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

17. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence $X_3\text{-Cys-}X_{2.4}\text{-B-}X_{12}\text{-Z-}X_{1.7}\text{-Z-}X_4$, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

18. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence $X_3\text{-B-}X_{2.4}\text{-Cys-}X_{12}\text{-Z-}X_{1.7}\text{-Z-}X_4$, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

19. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence $X_3\text{-B-}X_{2.4}\text{-B-}X_{12}\text{-His-}X_{1.7}\text{-Z-}X_4$, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

20. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, wherein the zinc finger component comprises the sequence $X_3\text{-B-}X_{2.4}\text{-B-}X_{12}\text{-Z-}X_{1.7}\text{-His-}X_4$, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

21. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 6, the zinc finger component comprises the sequence $X_3\text{-B-}X_{2.4}\text{-B-}X_{12}\text{-Z-}X_{1.7}\text{-Z-}$

X₄, wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine.

22. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim + 30, wherein the target sequence is in a plant cell.

23. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim + 30, wherein the target sequence is in an animal cell.

24. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 23, wherein the target sequence is in a human cell.

25. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim + 30, wherein the target sequence is a promoter sequence.

26. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim + 30, comprising three zinc finger components.

27. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim + 30, wherein the target sequence comprises about 9 to about 14 contiguous base pairs.

28. (currently amended): The isolated ~~zinc finger binding protein~~ polynucleotide of claim 26, wherein the third finger component comprises a non-canonical zinc finger component.

29. (cancelled)

30. (currently amended): An isolated polynucleotide encoding a non-naturally-occurring zinc-finger binding protein ~~according to claim +~~ comprising one or more non-C2H2 zinc finger components, wherein the protein is designed bind to a target sequence.

31. (original): An expression vector comprising the polynucleotide of claim 30.

32. (original): A host cell comprising the polynucleotide of claim 30.
33. (original): A fusion polypeptide comprising: (a) an isolated zinc finger binding protein according to claim 1 and (b) at least one functional domain.
34. (currently amended): The ~~fusion polypeptide~~ polynucleotide of ~~claim 33~~ claim 39, wherein the functional domain is a repressive domain.
35. (currently amended): The ~~fusion polypeptide~~ polynucleotide of claim 34, wherein the repressive domain is selected from the group consisting of KRAB, MBD-2B, v-ErbA, MBD3, TR and members of the DNMT family.
36. (currently amended): The ~~fusion polypeptide~~ polynucleotide of ~~claim 35~~ claim 39, wherein the functional domain is an activation domain.
37. (currently amended): The ~~fusion polypeptide~~ polynucleotide of claim 36, wherein the activation domain is selected from the group consisting of maize C1, VP16, p65 subunit of NF-kappa B, and VP64.
38. (currently amended): The ~~fusion polypeptide~~ polynucleotide of ~~claim 37~~ claim 39, wherein the functional domain is selected from the group consisting of an insulator domain, a chromatin-remodeling protein or a methyl-binding domain.
39. (currently amended): An isolated polynucleotide encoding ~~the a~~ a fusion polypeptide of claim 33 , wherein the fusion polypeptide comprises: (a) a zinc finger binding protein according to claim 30 and (b) a functional domain.
40. (original): An expression vector comprising the polynucleotide of claim 39.
41. (original): A host cell comprising the polynucleotide of claim 39.
42. (currently amended): A method of modulating expression of a gene, the method comprising the step of contacting a region of DNA with a ~~fusion molecule~~ polynucleotide according to claim ~~33~~ 39.

43. (currently amended): The method of claim 42, wherein the zinc finger binding protein of the fusion molecule binds to a target site in a gene encoding a product selected from the group consisting of gamma-tocopherol methyl transferase (GMT), vascular endothelial growth factor, erythropoietin, androgen receptor, PPAR- γ 2, p16, p53, pRb, dystrophin and e-cadherin.

44. (original): The method of claim 42, wherein the functional domain comprises a repressive domain.

45. (original): The method of claim 44, wherein the repressive domain is selected from the group consisting of KRAB, MBD-2B, v-ErbA, MBD3, TR and members of the DNMT family.

46. (original): The method of claim 42, wherein the functional domain comprises an activation domain.

47. (currently amended): The method of claim 46, wherein the activation domain is selected from the group consisting of maize C1, VP16, p65 subunit of NF-kappa B, and VP64.

48. (original): The method of claim 42, wherein the functional domain is selected from the group consisting of an insulator domain, a chromatin-remodeling protein or a methyl-binding domain.

49. (original): The method of claim 42, wherein the gene is in a plant cell.

50. (original): The method of claim 42, wherein the gene is in an animal cell.

51. (original): The method of claim 50, wherein the gene is in a human cell.

52. (currently amended): A pharmaceutical composition comprising a ~~non-canonical zinc finger protein according to claim 1~~ non-naturally-occurring zinc-finger binding protein, wherein the zinc finger binding protein:

(a) comprises one or more non-C2H2 zinc finger components, and
(b) is designed bind to a target sequence; and
a pharmaceutically acceptable excipient.